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OF

TUBERCULOSIS

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ORIGINAL ARTICLES.

THE PRESENT OUTLOOK OF THE VOLUNTARY SANATORIUM.

By A. ADAMS,

M.D., D.P.H.,

Medical Superintendent, the Liverpool Sanatorium, Delamere Forest, and Delamere Training Colony, Frodsham, Cheshire.

PRIOR to 1910 the only organized treatment for cases of Pulmonary Tuberculosis was to be obtained in (1) sanatoria usually associated with hospitals for diseases of the chest, endowed by public subscription or private munificence, where the patients were expected to pay a small amount to assist in covering the cost; and in (2) a number of privately equipped and conducted institutions for better-class patients who could afford to pay the full cost of their treatment, conducted on commercial lines.

Subsequent to the legislation of 1910 which empowered the local authority to undertake and bear the entire cost of the treatment of cases of tuberculous disease from public funds, there was a marked diminution in the flow of charitable funds; and the management committees responsible for the various sanatoria were compelled to take a course of extreme caution in regard to all relating to control and expansion. Owing to the efforts of the central and local authorities a rapid increase arose in the demands for beds whilst the municipalities and county councils were building and equipping or altering other premises for their new sanatoria, and during this period a number of privately owned premises were opened on admittedly commercial lines to meet the demand: thus we had an almost complete analogy with the general nursing system of voluntary hospitals, state or poor-law hospitals, and private nursing homes.

The action of the Ministry of Health in compelling each local

authority either to open its own institution for tuberculous subjects or to engage definitely a sufficient number of beds in other institutions to cover its needs, with a grant from the State funds on a 50 per cent. basis, further disturbed the outlook for the voluntary institution, and a serious problem arose as to whether they could continue to function in the face of this opposition. The further action of the Ministry in refusing to sanction the payment of public funds to the commercial sanatoria has partly cleared the outlook, and in view of the exercise of the "Geddes Axe" and the new economies initiated by the Chancellor of the Exchequer, the question is now assuming a new phase and deserves fullest consideration.

The issue of Memorandum 94 T., 1923 and 1924, with the necessity for preparing the required figures on Form T. 90 for compilation of the 1925 Memorandum, will have fixed the attention of Medical Superintendents like myself, engaged in conducting a voluntary institution, on the problems involved, and I think a few observations on the figures obtained may help to give guidance as to the future outlook. At present, the Ministry sanction a payment from the Exchequer funds of 50 per cent. of the cost of treatment of all patients approved by the Tuberculosis Officer. In some areas a payment is demanded from the patients according to their ability to pay, and this is credited to the cost of treatment. The variation in the cost of treatment at the different institutions is remarkable, ranging from 84s. 2'9d. to 27s. 4'6d. per bed per patient-week, and it is obvious that if the treatment supplied in the two institutions is comparable, the Ministry in the case of the higher rated institution is paying 28s. 5d. per patient-week more to the authority with the higher cost than is justifiable, and as both are under the supervision of the Ministry's officials, and the patients have usually full opportunity for bringing to their notice any complaints as to neglect, underfeeding, etc., it must be presumed that both are fulfilling their purpose and giving satisfactory treatment.

The action of the Board of Education and the recent debates in the House of Commons show that the policy of the Exchequer is tending towards the block grant system, and in view of the disparity in cost quoted, this appears to be the most impartial and economical system which could be adopted, for it is manifestly unfair that the local authority or institution which can by careful management reduce its cost to a minimum should receive 28s. 5d. less per patient-week than the more extravagant one. Under the block grant system the average cost for treatment in the average institution would be taken and 50 per cent. of this cost paid by the Ministry. In the case of the economically run institution, this amount would represent more than 50 per cent. of cost and the saving to local authorities would be considerable, but in the expensively run institution the extra cost would

fall entirely on the local authority and thus prove a direct incentive to economy.

I have had extracted from the returns for last year the comparative cost of all comparable institutions managed by voluntary bodies and by county councils and boroughs, and find that in the former the average cost per patient-week is 48s. 2·4d. and in the latter 50s. 3·2d. The disparity in these figures led to a further research to find where the extra cost went. For comparison, the six largest voluntary institutions were compared with six representative local authority institutions of approximately the same number and composition of patients, and it was found that the main difference in cost lay under the heading—"Loan Charges." Under no other column was there any noticeable difference other than the number of occupied beds, which in the local authority institutions reached 95·5 per cent. and in the voluntary 91 per cent., a difference of 4·5 per cent. in favour of the public control. This shows that the voluntary institutions suffered from a comparative shortage of patients, and it is obvious, with their standing charges unchanged, that the relative cost of treatment for patients in these institutions is necessarily high, other factors being equal.

In the case of loan charges practically none of the voluntary institutions bear any entry under this heading, as the buildings have been erected by public subscription and are usually without debt; but as these buildings have been in use some time and have been subject to small extensions, the item "Repairs and Renewals" is, as is to be expected, slightly heavier. Eliminating Loan Fund, and Repairs and Renewals Account, there is a difference in favour of public management of approximately 5 per cent. over the voluntary institutions, but this is probably accounted for by the smaller average number of beds in the voluntary institutions and by the difference in number of occupied beds as stated. One fact emerges clearly from the mass of statistics—voluntary management can compete successfully on an equal basis with public control of hospitals and sanatoria, with smaller cost to the state.

Further, the local authority is practically confined to its own area for a site, but the voluntary institutions were first in the field, and usually the best site within a radius extending frequently to fifty miles of the city was selected and the institution built.

It must be obvious that, to those working among sufferers equally with the sufferers themselves, the change of environment is most beneficial both physically and mentally.

As the expansion in numbers of institutions under the pressure of the Ministry has now almost satisfied the demand, the number of new institutions in the present financial stringency is unlikely to be increased, and any further beds required will most probably be additions to the present institutions. Great difficulty would be experienced in obtaining

a 50 per cent. grant from the Ministry for such extension now without proof of absolute necessity.

Most of the voluntary institutions, despite the diminution in their annual subscriptions, are in a sound financial condition. The endowment funds invested are bringing in an annual return in interest. The cost of treatment of the great majority of patients for whom the institutions were originally provided is covered by the public fund, and the only expense incurred is for the new poor in some districts where the local authority has not risen to its obligations, or for a small number of patients who refuse or are refused treatment in their local institution and have recourse to the endowed beds in voluntary institutions. In addition to the annual subscriptions, another source of revenue has to be considered: numerous legacies have become payable or are contingent for the established sanatoria, and this source of income is likely to continue for at least a generation as a diminishing quantity.

After the fullest consideration of these facts, is it not the duty of the voluntary bodies to utilize a portion of their invested surplus funds for the purpose for which they were contributed—viz., expansion—to meet the present and growing exigencies, and this without having recourse to the full Government grant of 50 per cent.? That there is a need for more beds is evident from the figures quoted of the average number of beds occupied in both classes of institutions, showing that they have practically reached the possible limit to which they can attain. By this expenditure they would best justify the confidence reposed in them by the subscribers, relieve the authorities of a great outlay during the present period of financial stress, and provide the necessary opportunities for the control and eradication of tuberculous disease which is their main object, without incurring any serious risk or damaging their future success or seriously increasing their future liabilities.

A full study of the Memorandum will convince readers that, given a fair field, the privately or voluntarily controlled institution can always successfully compete with the public or state-owned authority, as is well recognized in our great industries and services. The disappearance of the voluntary sanatorium would be almost as definite a loss as that of the voluntary hospital; and it would mean the complete loss of much practical charity, with its attendant interest in the fight against tuberculosis, without any compensating gain.

A further point might be raised as to which is preferable to the patients, as some refuse, or only agree in the last resource, to enter the public sanatorium. This is more marked in the smaller areas, where patients of different social status must mix on equal terms with others from the same district, whom they have previously known in other circumstances—and a very real difficulty arises here; and no provision is made for the patient who is prepared to pay for more privacy

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and attention than the general run, but at the same time cannot afford the fees of the privately owned sanatorium, as in the case of the small shopkeeper, clerk, shop assistant, or foreman. A choice of various institutions, where no extra cost would fall on the funds, helps to overcome this difficulty.

Amongst the patients there appears to be a little doubt that, given a choice, they would prefer the voluntary sanatorium, with its freedom from bureaucracy and civic control, as they do the voluntary hospital to all others, and if this can be secured without extra cost a very real help will be afforded, and there is little doubt that benefit in both physical and psychological conditions would be conferred on the patients and the community.

PREVENTION OF TUBERCULOSIS IN JAPAN.

By DR. TADASHI SATOW,

Medical Officer of Health in the Japanese Department of Home Affairs, Tokio.

The History of Anti-Tuberculosis Work in Japan.

TUBERCULOSIS is a disease which has existed in Japan from very ancient times. In the oldest of our works on medicine, entitled "Ishinho," and written in 984 (the second year of Eikan), there is to be found a paragraph describing the symptoms and explaining something of the pathology of pulmonary tuberculosis. Very much later, about the middle of the period under the Tokugawa military government—that is to say, in 1805 (the second year of Bunka)—another medical book, entitled "Zatsubyo Kibun," appeared, in which the writer contended that tuberculosis was an infectious disease. About the same period there existed some physicians who held the opinion that the disease was contagious and through the media of rooms, utensils, clothes, and other things used by tuberculous patients.

After the restoration of the Imperial Government, much attention began to be paid by the authorities in regard to the suppression and prevention of tuberculosis. In 1890 (the twenty-fifth year of Meiji), when Koch's tuberculin was prepared for the first time, the department for Home Affairs promulgated an ordinance with regard to its use. In April, 1904 (the thirty-seventh year of Meiji), the Government promulgated for the first time a Department for Home Affairs ordinance concerning the prevention of pulmonary tuberculosis. In this ordinance it was provided that in schools, hospitals, factories, theatres, and

other places designated by local governors, spittoons should be provided, spitting elsewhere in such places being strictly forbidden. It was made a rule that inns at mineral springs, watering places, and health resorts should provide themselves with adequate preventive accommodation, and prisons, government schools, hospitals, municipal almshouses, railway stations, and cars, and other places where a large number of people gather, were also directed to take similar measures, while the duty of seeing to the enforcement of all these rules and directions was put in the hands of police officers. Subsequently, in March, 1914 (the third year of Taisho), a law (Law No. 16 of the third year of Taisho) was enacted concerning the establishment of sanatoria for pulmonary tuberculosis, which provided for grants-in-aid to be made from the National Treasury for those established by cities containing more than 30,000 inhabitants. Five years later—viz., in March, 1919 (the eighth year of Taisho)—the above-mentioned ordinance was replaced by the Law for the Prevention of Tuberculosis (Law No. 26 of the eighth year of Taisho), which has since been in force, and by which measures have been provided for in order to make the prevention of tuberculosis more thorough and effective.

As for civilian enterprises for the same purpose, in 1911 (the forty-fourth year of Meiji) the Japan White Cross Society was organized, and in 1913 (the second year of Taisho), the Japan Association for the Prevention of Tuberculosis came into being. Subsequently similar societies have also been organized in various localities.

Statistics Regarding Deaths from Tuberculosis in Japan.

The first statistical study regarding the situation of tuberculosis in Japan was undertaken in 1899 (the thirty-second year of Meiji). Judged from the tuberculosis mortality rate during the past ten years, it must be said that the spread of the disease has not as yet shown any definite signs of abatement. The situation is nearly the same throughout all parts of the country, but it is noticed that the tuberculosis death-rate is higher in cities than in rural districts. For instance, according to statistics for the five years 1915-1920, the average number of deaths from tuberculosis was 23.11 per population 10,000 for the whole country, but it was found that the average number of the same for more than forty cities, each having a population exceeding 50,000, was 36.09. Again, according to investigations conducted for several years since 1918 (the seventh year of Taisho) by the Department for Home Affairs and local governments with regard to health conditions in agricultural villages, of 105,650 constant inhabitants of fifty-six villages, 536 (0.51 per population 10,000) were found to be sufferers from tuberculosis, and it was also found that during the preceding ten years the death-rate from tuberculosis in these villages was 15 per 10,000

inhabitants. From these figures it is plain that the death-rate from tuberculosis is very much higher in cities than in villages.

Of the deaths from different varieties of tuberculosis, those from pulmonary tuberculosis stand highest in number, followed by those from intestinal tuberculosis. As regards sex-differences, the death-rate of women from tuberculosis is almost always higher than that of men, regardless of forms of tuberculous affection or localities. As for ages, from average numbers taken during the past ten years, it is seen that the death-rate is highest among men between twenty and twenty-five years of age, and among women between fifteen and twenty years of age, followed by men between fifteen and twenty years of age, and women between twenty and twenty-five years of age.

Legislation in Force in Japan Relating to the Prevention and Arrest of Tuberculosis.

With regard to the prevention of tuberculosis there are certain laws and regulations already referred to. There was lacking, however, until recently, a general law covering the entire field. Some such measure was much to be desired if progress in securing effective prevention was to be attained. In view of this, the Government enacted such a law, and at the same time took upon itself the power to order each city containing more than 50,000 inhabitants, as well as public corporations considered specially, to undertake the establishment of a sanatorium for tuberculosis. The law mentioned was the Law for the Prevention of Tuberculosis. It was enacted in March, 1919 (the eighth year of Taisho), and has since been in force.

The term "tuberculosis" used in the present law designated such forms of pulmonary and laryngeal tuberculosis only as are feared to be the most dangerous causes of the spread of infection, and so are the most important objects for prevention and suppression for the sake of public health.

By virtue of the present law physicians are charged with the duty of indicating to tuberculous patients and other persons the need for disinfection and other preventive measures, while the patients and other persons to whom indication has been given are in duty bound to carry out such measures.

Among matters necessary for the prevention of tuberculosis to be carried out by administrative authorities disinfection has a foremost place. The administrative authorities are required, with respect to a place where a person has suffered from tuberculosis or has died of the disease, to carry out the disinfection of the building and articles therein, and take other measures in case these have not been satisfactorily carried out.

The administrative authorities also carry out health examinations of persons who are engaged in occupations which are from their nature

conducive to the development and spread of tuberculosis or those who live in places where the spread of virus is feared or are engaged in occupations in such places. Persons suffering from tuberculosis are prohibited from engaging in occupations which are from their nature conducive to the spread of infection.

The administrative authorities, with respect to schools, hospitals, factories, and other places where a large number of persons gather, as in inns, restaurants, barbers' shops, and other places, which make it their object to gather guests, restrict or prohibit matters which will become agents for the spread of tuberculous infection, or cause the persons in charge of such places to make necessary accommodations for the prevention of tuberculosis. The administrative authorities also restrict or prohibit the use of buildings which are unhealthy, and extend financial aids to those tuberculosis patients who have been caused to enter a sanatorium and on that account have lost their means of living.

The old regulations concerning the prevention of tuberculosis provided that cities having more than 300,000 inhabitants should be ordered to establish sanatoria for tuberculous cases. This provision was enlarged in the revised law to the extent that cities with a population of not less than 50,000, and other public corporations which are deemed especially necessary, should establish sanatoria for tuberculosis chiefly for the purpose of admitting therein tuberculous patients who have no means for treatment. With regard to such compulsory establishment of sanatoria, the National Treasury make to cities grants-in-aid to the amount of one-half of the sums expended by them in their establishment, as well as of one-fourth of the ordinary expenditure defrayed by them for their maintenance. The National Treasury also make to public corporations or juridical persons, who have established sanatoria for tuberculosis, grants-in-aid to the amount of less than one-half of the expenditure defrayed by them for their establishment and maintenance. These grants-in-aid are made so as to facilitate and increase the establishment of sanatoria for tuberculosis.

Present Conditions of Equipments for the Prevention of Tuberculosis.

In conformity with provisions of the Law for the Prevention of Tuberculosis, the Minister for Home Affairs ordered the six biggest cities in Japan with a population exceeding 300,000 to establish sanatoria for tuberculosis. The names of the sanatoria established by these cities, the date of their opening, and the number of patients to be admitted therein, are as follows :

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Name of Sanatorium.	Date of Opening.	No. of In-Patients.
Tokyo Municipal Sanatorium ...	June, 1920	800
Osaka Municipal Toneyama Sanatorium ...	Sept., 1917	350
Kyoto Municipal Utano Sanatorium ...	Nov., 1920	100
Yokohama Municipal Sanatorium ...	Feb., 1920	100
Kobe Municipal Tonden Sanatorium ...	Oct., 1918	100
Nagoya Municipal Yagoto Sanatorium ...	April, 1922	100

Besides these, in accordance with provisions of the revised law enacted in 1919 (the eighth year of Taisho), eleven cities with a population of not less than 50,000—namely, Nagasaki, Hiroshima, Hakodate, Gifu, Shizuoka, Niigata, Okayama, Kanazawa, Sapporo, Utsunomiya, and Fukuoka—have been ordered to establish sanatoria for tuberculosis. Of these, Nagasaki and Niigata have already completed such establishments. The sanatorium in the former city began to admit patients in March, 1921 (the tenth year of Taisho), and that in the latter in February, 1923 (the twelfth year of Taisho). The other cities are now completing preparations for establishing sanatoria. The Government is putting forth efforts to have more sanatoria established, and some public corporations already maintaining them are planning their enlargement.

The Salvation Army and the prefectural authorities of Fukushima established sanatoria in 1917 (the sixth year of Taisho) and 1918 (the seventh year of Taisho) respectively, and have since been engaged in the relief of tuberculosis patients. Towards these institutes the Government, in conformity with provisions of the law, has been making grants-in-aid with a view to helping their development.

In addition to the preventive measures so far mentioned, the Japan Red Cross Society, acting on a resolution passed at the eighth general conference of the International Red Cross Society, began in 1913 (the second year of Taisho) to take up the work for prevention and suppression of tuberculosis, carrying out, among other things, the diagnosis of the disease in its early stages and also the treatment of patients. The branches of the society in Osaka, Hyogo, Aichi, Gifu, Fukushima, and Kagoshima prefectures have established sanatoria for tuberculosis, while at the hospital attached to the headquarters of the society and similar institutes belonging to its local branches rooms have been provided for tuberculosis patients. At the end of October, 1924 (the thirteenth year of Taisho), the total number of paying and free patients under treatment in them was about 300. The Saisei Kai, a philan-

thropic organization endowed by the Imperial household, has also established sanatoria for tuberculosis at several places, besides having rooms for tuberculosis patients at hospitals and consulting stations belonging to its local branches. At the end of September, 1924 (the thirteenth year of Taisho), there were altogether 477 beds for tuberculous patients in these institutes. It may also be mentioned here that both the Japan Red Cross Society and the Saisei Kai have no small number of hospitals and medical practitioners in the provinces under commission specially for tuberculosis patients.

There are in existence throughout Japan about thirty private sanatoria and hospitals for tuberculous subjects. Also eight public hospitals contain rooms for tuberculous patients, numbering 118 beds at the end of 1923. There are also many private hospitals containing altogether about 1,320 beds for sufferers from tuberculosis. Counting all the beds for tuberculosis cases in all these institutes, the aggregate number is about 3,000.

Among civilian enterprises for the prevention of tuberculosis the work of the Japan Association for the Prevention of Tuberculosis deserves special mention. This body is putting forth great efforts to provide for popular education concerning tuberculosis. It has also frequently made representations to the Government concerning the same subject, and has done good work in the way of suggesting the establishment of similar organizations in the provinces as well as of promoting co-operation among those already established. As a matter of fact, through suggestions made by the society, more than forty associations have come into being in the provinces. These local associations, in conjunction with the central organization, are working for the spread among the people of Japan of knowledge concerning the prevention of tuberculosis, examination of tuberculous patients in the early stage of the disease, and establishment of disinfecting stations. In recent times they have also actively taken up the work for the provision of open-air colonies for children subject to scrofula and other manifestations of tuberculosis.

Another civilian work meriting mention is that of the Japan White Cross Society, which opened its useful campaign years ago, in providing means for the early diagnosis of tuberculosis as well as the provision of effective treatment for tuberculosis patients in needy circumstances and for a nominal fee. The society was also the first in Japan to open a permanent open-air school for tuberculously-disposed children on the seashore beach at Kowada in Kanagawa Prefecture. This was carried out in 1916 (the fifth year of Taisho), and some excellent results have been obtained. Finally, it should be mentioned that all these organizations for the prevention of tuberculosis have now formed a union or federation amongst themselves, and a general conference is held once every year.

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Popular Education Concerning the Prevention of Tuberculosis.

With regard to the prevention of tuberculosis, one thing which is regrettable is that the people at large in Japan lack as yet reliable and helpful knowledge concerning the disease, and for this reason do not possess desirable understanding in co-operating in focussing on its prevention. Accordingly the Government has been and is endeavouring to educate them by extending aid to local associations for the prevention of tuberculosis. For instance, the Government printed in 1922 (the eleventh year of Taisho) a pamphlet entitled "The Nation and Tuberculosis," and distributed a large number of copies. The local governments, the Japan Red Cross Society, and various associations for the prevention of tuberculosis, are also actively engaged in the same work by means of booklets, posters, popular lectures, cinematograph shows, propaganda by flying machines, and so forth.

Expenditure on Measures Aiming at the Prevention and Arrest of Tuberculosis.

The aggregate estimate of expenditure for the fiscal year 1924 of the eight sanatoria for tuberculosis already established in conformity with provisions of the law is 1,926,479 yen. Of this amount, one-fourth is given them by the National Treasury in grants-in-aid. During the same fiscal year the aggregate estimate of expenditure for preventive work against tuberculosis undertaken by local governments is 107,172 yen, the National Treasury making grants-in-aid to the extent of one-fourth of the total amount.

PERSONAL EXPERIENCES WITH VARIOUS REMEDIES USED IN THE TREAT- MENT OF TUBERCULOSIS.

By A. NIVEN ROBERTSON,

M.D.,

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Chesterfield.

Tuberculin.—The number of tuberculin is legion. I have used the majority of them both in pulmonary and surgical cases, and my final conclusion is that they are of little value in treatment, and if they are used in a careless manner I believe they can do considerable harm. Of the more recent forms of tuberculin, which include Dreyer's Diaplyte

Tubercle Vaccine, Nathan Raw's Tubercle Vaccine, Crofton's H.T.S., Paget's nasal inhalation of B.E., Phagolysine or Gabrilowitch's Endotin, I can only say that they are all equally ineffective. Nor have I found Sir Robert Philip's inunctions of O.T. of any value. Each one in turn has been given up as useless.

Spengler's I.K..—The great advocate of this treatment is its originator, Carl Spengler, who gave up the use of tuberculin in preference to it. This agent is often erroneously described as a tuberculin; it is rather an antidote to it. Personally I gave it a very thorough trial, both by injection and inunction, but it gave no striking effects and I no longer use it. One had hopes of its value in advanced cases, but these hopes proved to be vain.

Sodium Morrhuate.—This was introduced by Sir Leonard Rogers and can be given subcutaneously or intravenously. I only tried the former method and gave it up as useless, and I believe many others have come to the same conclusion; but it still has some advocates. Many gave it up because of the severe febrile reactions often caused and without any compensating benefit.

Pneumosan.—This I have tried in numerous cases who were not doing well under ordinary treatment and who had fever and were toxæmic. It had no effect on general health, on pyrexia, or on the toxic state. Pneumosan has a curious smell, and is of a striking blue colour, and doubtless some patients felt they were thus really "getting value for their money"; but otherwise, as far as I could estimate, the effects were nil.

Nascent Iodine.—This was originally much lauded by Dr. Curle of Glasgow. In 1915 and 1916 I gave it a good trial, using the approved technique, and giving a large dose of K.I. in the morning, followed by drinks of chlorine water in lemonade. The first case on whom I tried the method unluckily happened to be an actor, and he got such severe iodism with the first dose that I found him on the same night raving in his cubicle, with his eyes and nose running, and his mouth so sore that he had his false teeth out. He was gesticulating and shouting, that death was better than such misery. The result was that any future patient that I put on the iodine treatment was encouraged to it by his comrades with the assertion that death was better! However, I had the courage to inform my actor friend that another dose of the K.I. would cure his iodism, which it fortunately did. It took some persuasion to make him believe that another bite from the dog which bit him would cure him! The administration of iodine seemed to increase the moist sounds in open cases, and produced some focal reaction, but I never found that there was any real permanent benefit as the sequel, so the Nascent Iodine therapy was finally relinquished.

Angiolymphe.—The sponsor for this treatment is Dr. Rous of Paris.

It is said to consist of glucosides obtained from three plants: *Ixia rosea*, *Morea sinensis*, and *Orchis maculata*. This preparation is put up in ampoules ready for injection, and is injected into the gluteal muscles. I used it last year in a fair number of cases, and can agree with other observers that the patients said they felt better when they were having it and some of them appeared to look better. But is there any new remedy not actually harmful which has been given in this disease to which the same remark does not apply? If the patient is treated by injections of any new drug, the psychological effect is at once produced. He is buoyed up with hope in the new remedy and feels something is being done for him beyond mere diet and fresh air, and at once his whole metabolism reacts to it, and he says he feels better. I should ascribe any good result from Angiolympe only to the psychical effect.

Collosol Calcium.—This has been warmly praised by Dr. Prest, who has great faith in its powers of stopping hæmoptysis. My faith in its powers, however, has been lowered to zero. It seemed to me to have no effect on hæmoptysis. Indeed, one case in which there was no hæmorrhage developed frequent small hæmoptyses after he had had numerous doses of this supposed remedy for them. I never saw it have any favourable effect in arresting hæmorrhage, in producing fibrosis, or lowering temperature, and it has now vanished from my pharmacopœia. In one or two cases I tried colloidal silica combined with *Drosera rotundifolia*, but it was equally impotent. Collosol silver was tried, but it also was ineffective. Collosol ferrum, especially when combined with collosol manganese and arsenic, is of value in the anæmia of tuberculosis.

Creosote and Guaiacol.—In many cases I have tried creosote, guaiacol, and terebene separately, but have given up using them as they all gave disappointing results. Thiocol and styracol were also ineffective.

Allyl Compounds.—Garlic or allyl sulphide was largely used a good many years ago. I have employed it in the mixture provided by Messrs. Allen and Hanburys. It had no definite effect. The other allyl compounds I have tried are: (1) Aniodol (a watery solution of trioxymethylene allyl sulphate); (2) Thiodin (compound of allyl thio-urea); (3) Yadil (said to contain allyl carbide); and (4) *Armoraciæ Radix*. The last is said to contain a glucoside sinigrin (potassium myronate) and the enzyme myrosin. These interact in the presence of water and produce volatile oil of mustard, allyl isothiocyanate. It is best given as spiritus armoraciæ co. along with sp. chlorof. and sp. ammonia aromat. These were all tried in the hope that the allyl compounds might be effective on the ground of the reputation of garlic, but all failed. Dr. Minchin and others have strongly advocated the use of garlic in the treatment of tuberculosis.

Gold Compounds.—Gold compounds of various kinds have had their advocates for many years. The latest preparation is designated Sanocrysin. I suppose it is too early to give a verdict on it, but it is being ushered in with the usual favourable reports on new remedies in tuberculosis, such as disappearance of tubercle bacilli, lessening of sputum, etc., and the usual favourable effects in animal experiments. I have not had an opportunity to use it personally.

Cod Liver Oil.—This agent still stands the test of time. There is certainly no doubt of its value in children suffering from under-nutrition and hilus tuberculosis.

Popular Remedies.—There are numberless popular remedies. Some of these I have tried at a patient's request. Among them are Steven's "cure" with Umckaloabo, "Tuberculozyme," and Yadil. None of these, as far as I have been able to ascertain in any of my cases, have exercised the slightest effect. During the Yadil boom so many patients asked for it after seeing the brilliant pictures in the lay press of Yadil, the Conqueror of Tuberculosis, that I had a stock medicine called Mist. Yadil Expect. They certainly all expected much, and some felt its good effects at once; but when the *Daily Mail* exposed it, the good effects disappeared. I must also admit to thinking at the time that it perhaps had some effect in bronchitic cases with much sputum, but we are all liable to be influenced by vague impressions.

Antiseptic Inhalations.—The three chief upholders of treating pulmonary tuberculosis by medicated inhalations have been Dr. Muthu, Dr. Ruata, and the late Dr. Lees. I have for long used Lees' drops and Muthu's inhalant formulæ as routine measures. They are helpful in cases with catarrhal mixed infection and chronic bronchitis, and also in cases of bronchiectasis with copious septic sputum, but they are not cures for pulmonary tuberculosis. I think these inhalations are sometimes useful in cases with ulcerative tuberculous laryngitis. The same remarks apply to garlic inhalations.

Gamelan.—I have watched a certain number of cases on this treatment. Gamelan is composed of various fats, waxes, and lipoids. It was found that a certain larva, *Galeria melonella*, had the power to digest various waxes made by bees, and was also resistant to injections of tubercle bacilli, and it was supposed that this resistance might be due to its power of digesting the wax of the tubercle bacilli and thus destroying them. The tubercle bacillus is regarded by many as being of a waxy nature, and the bacillus also contains lipoids. It was argued, therefore, that injection of lipoids and waxes into the human being might increase the number of antibodies in the blood to lipoids and wax, and the blood thus enhanced in its powers might attack the lipid waxy bacillus and thus destroy it. Gamelan injections I found

gave no results. The tubercle bacilli were not reduced in numbers, and the patients showed no improvement.

Autogenous Vaccines.—I believe these are of some use in secondary infections, particularly in bronchitics and asthmatics afflicted with tuberculosis. I remember one case of asthma who was quite cured by a series of doses of autogenous vaccine; but, of course, we all know that asthma often has an underlying nervous element in its causation. My patient was of the neurasthenic type.

There are two methods of treatment which I definitely have confidence in. The first is sanatorium treatment. There is no doubt that up to the present it is our best method of raising the resistance of the tuberculous patient. There are many who will say that the good results are often not permanent, and with this I agree; but this is due to the fact that the treatment is often so short owing to financial difficulties. The very fact of relapse on return home in many cases proves the value of the treatment while it lasted. I regret that I have never yet seen published the after-results of the many great Swiss sanatoria for pulmonary tuberculosis. It would be most useful to be able to compare the after-results of the treatment in these private Swiss sanatoria with those of the private and public sanatoria in our own country as a test of the Swiss climate, which is so much praised. Also I would like to see more information available regarding after-results of patients who have been treated in private sanatoria in our own country for comparison with the same results in the many "working-class" sanatoria at home. With such data we might discover how much longer was the expectation of life in wealthier ex-sanatorium patients than that in artisan patients, and it would probably reveal more forcibly how much of the good work done in the "working-class" sanatorium was wasted by the patient's too early return to bad home surroundings.

The second is artificial pneumothorax. I have no doubt of its efficiency in properly selected and supervised cases. By its means the results are sometimes striking and most gratifying. A unilateral case rapidly going downhill and in bed may by this treatment in a very short time be changed into a happy human being, able to walk about and take an interest in life. But here again the end results are less encouraging. In many the resistance is not permanently raised, and the other lung deteriorates in time. This fact, and the knowledge that the treatment is applicable with success in only a small minority of patients, makes artificial pneumothorax far from generally applicable for the treatment of pulmonary tuberculosis.

I cannot say that the history of the treatment of pulmonary tuberculosis where the disease is well established, with tubercle bacilli definitely demonstrated in the sputum, can be considered encouraging.

It is a history of the trial of one so-called remedy after another, each having its day and then being given up. I believe we are far from the discovery of a real cure. The key to successful treatment probably lies in the discovery of the hidden factors which subtly increase or decrease resistance to the activities of the tubercle bacillus in the human species. Possibly there is besides the bacillus a specific factor, such as Gye suggests exists in cancer—in other words, a special “soil.” Until we know more the watchwords must be prevention and research, and still more research.

THE ALPINE CLIMATE IN SUMMER AND WINTER.

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FOR many years now—at least forty or fifty—mountain climates have been widely recognized as being beneficial for the treatment of certain diseases, and for the prevention and arrest of various pathological conditions ; but it is for the management of tuberculous patients, especially those afflicted with tuberculosis of the lungs, that high altitudes have obtained their chief fame as health resorts. It was the fact, noticed by several observers, that the incidence of tuberculosis of the lungs was very rare amongst the inhabitants of mountain villages, which led to the idea that this type of climate might be of benefit in dealing with the disease. It is well known that a holiday in the Alps to a healthy man, but one who is tired and overworked, is generally of very great benefit. Such people often make yearly visits, either in summer or in winter, and return home refreshed and invigorated. As regards morbid conditions, especially tuberculosis, the patients who gain greatest benefit from a sojourn in the mountains are those in whom the disease is in an early stage, and who are still fairly robust and have good powers of resistance and reaction. In former years it was the practice to send all types of cases to the mountains, but it was found that the very debilitated, emaciated patient, in an advanced stage of tuberculous disease, with caseation, softening, fever, etc., did not do well, and, in fact, often their lives were, if anything, shortened. In the present paper we

desire to describe the climatic conditions existing at Davos both in summer and in winter. Our exposition is based on prolonged investigation carried out at the Davos Observatory, and it will, we believe, enable the reader to estimate the advantages of the Alpine climate for the robuster types of tuberculous patients, and the suitability of the summer as well as the winter climate for the treatment of tuberculous subjects.

General Features of Alpine Climatic Stations.

The advantages of a sheltered, elevated valley climate are admitted. These are lower atmospheric pressure; protection from wind; small amount of cloudiness; freedom from fog; cool, dry air, free from dust and microbes; a high degree of insolation, both qualitatively and quantitatively; and a high degree of radiation.

As is well known, the high mountain climate differs fundamentally from all other climates, by reason of its lower atmospheric pressure. In respect of its physiological effect, besides the stimulation to increased breathing and blood formation, due to the less weight of oxygen in each volume of air breathed in, the mechanical results of the lowered pressure must not be overlooked. In the middle of the summer the average atmospheric pressure on Alpine heights of 1,500 to 1,800 metres elevation is about 8 to 10 millimetres higher than in winter. In comparison with the winter climate, the summer climate is that of a place about 150 metres lower. The degree of stimulation due to the lower atmospheric pressure is lessened in summer in Davos. The shelter from wind, which the high mountain ranges to the west and east afford to the valley of Davos, generally keeps out extremely bad weather in summer as well as winter, seldom admits violent storms to the valley, and at the same time regulates the circulation of the air, so that on all sunny days there is a cooling valley wind from early in the morning till towards the evening. The velocity of the wind is in January 0.60 metre per second; in July, 1.65 metres per second.

The variation of cloudiness in the course of the year in the heights of the Swiss mountains is, roughly speaking, opposite to that in the South and Midland districts of England, the maximum falling in summer, the minimum in winter. Nevertheless, the cloudiness in Davos in summer does not exceed the mean cloudiness of the South of England, is more favourable than in the middle of England, and much more favourable than in the North of England and Scotland. In summer there is scarcely any fog; out of 300 July days there occurred only one day with a few hours' continuous fog. In summer the dryness of the air is not so extreme as in winter; in fact, the relative humidity exhibits an absolutely lower degree, a daily mean of 75 per cent. in July against 81 per cent. in January (at midday 58 per cent. in July as against 70 per cent. in January); while, on the contrary, the

absolute humidity in July rises to three times that of January—namely, 7·86 against 2·39; and with this, the physiological deficit of saturation (the difference in the water vapour contained in 1 cubic metre of the air with that which 1 cubic metre of air contains when saturated at 33° C.), which influences the evaporation from the lungs and skin, sinks from January to July from 44·3 to 38·8. The greatest difference between summer and winter is in the temperature of the air; the January mean of -7·1° C. is opposed to one of 11·8° C. in July. In the extreme months it amounts to—

		January.	July.
Mean of maxima ...	...	- 1·1	+ 17·7
Mean of minima ...	...	- 11·9	+ 5·9
Mean of absolute maxima ...	...	+ 5·1	+ 24·6
Mean of absolute minima ...	...	- 21·9	+ 0·7

The average maximum of July lies about 4·1° C. lower than on the south coast of England; the absolute maximum about 6·4° C. lower than in London, where a maximum of 31° C. has been recorded. These figures are proofs of the coolness persisting during the height of summer in the high mountains, witness the low average minimum of July of +5·9° C. The regular cooling effect which occurs each evening is of greatest advantage to lung cases and convalescents when, as in the high mountains, it is combined with dry air.

In summer the freedom of the air from dust is guaranteed by the high valley being covered with an almost uninterrupted extent of meadows surrounded by woods; its freedom from sources of infection by the dry cool air which descends every evening from the high mountains. In conjunction with the ionizing effects of the sun's rays, which are rich in ultra-violet rays, this descent of the air conduces to the electric conductivity, which in summer becomes about double that in winter.

The conditions of the soil are extremely favourable, for even after heavy, long-continued rain the water rapidly disappears, mostly through flowing to the bottom of the valley, partly through evaporation from the rocks and meadows, which are rapidly warmed by the radiation from the sun and sky. Another favourable condition is the pine-woods, which are easily reached, but are yet not too close. Woods favour the formation of mist through the rapid evaporation from the surfaces of the leaves and pine-needles. This accelerates the cooling down of the air, the bringing about of that equilibrium of temperature between the substratum of the air (the trees) and the lowest air layers which is necessary to the formation of cloud. For these reasons the clouds hang lower and heavier over the woods. Of no little value is the absence from the high mountain regions of troublesome insects, especially mosquitoes.

The Rôle of Sun Radiation.

The intensity of radiation, so marked a feature of the high mountain climate, is strongest in the summer months. As a matter of fact, however, the whole energy of the direct solar radiation does not reach its maximum in the high summer months, because the more humid atmosphere of the summer weakens considerably the ultra-red part of the spectrum; nevertheless, the high sun in the summer is the richest in the most important rays of the sun from the biological point of view, the ultra-violet. In July the sun is hardly hotter than in January, but about ten times as rich in ultra-violet rays. It is a great advantage that, during the warm air temperature of the summer, of the penetrating ultra-red rays relatively few are present, while they are plentiful in the cold seasons of the year (winter and spring), when they are desirable. While there are thirteen days of January with 75 to 100 per cent. of the possible hours of sunshine, there are only 10.4 such days in July; but as in July the sun is about twice as long in the sky as in January, there is ample opportunity afforded for the use of its rays in summer, and in prescribing the amount of the dose it is necessary to warn against "too much."

Loss of body heat by radiation represents an extremely important, but often undervalued, climatic factor; it is deficiency of this in the height of summer which, above all, can make unbearable residence in towns and in places in the lowlands protected from wind—places, that is to say, with an atmosphere of high humidity. Streets, buildings, clothing, all the surroundings of humanity, remain at a high temperature, even during the night, and do not permit people the relief of exchange of warmth through radiation. The radiation in Davos is about 23 per cent. greater than in the open plain, and in conjunction with the dry, clean air descending from the heights it brings each night a refreshing coolness to the ground, the houses, the whole of nature. Next day the sun must begin afresh to warm up the valley, and therefore can never bring this to the same radiation temperature as would be the case without that energetic cooling off which takes place each night.

The cooling power depends upon the temperature of the air, insolation and radiation, wind, humidity, and is most important from the climatic point of view; for the loss of body heat goes, within wide limits, parallel with the production of heat, and the production of heat with the utilization of food, appetite, activity of respiration and the heart. Systematic measurements of the cooling power of the air, as measured by the kata thermometer, are up to now extant only in Davos; they show a result which is deducible only with difficulty from the usual figures of meteorological tables—namely, an extraordinarily small variation during the day (19.8 to 18.1 from midday till morning is the average of the

year), and in the course of the year (22·5 to 14·7 from January to July in the middle of the day), in spite of the great variations in the temperature of the air. The explanation of this is the small amount of movement of the air, which increases from winter to summer, and the great dryness of the atmosphere. So far as can be determined from the statistics of other places, the high valley, which is sheltered from the wind, in spite of the low air temperature, makes a smaller demand for warmth on the yearly average than all places north of the Alps, and, what is especially astonishing, this demand for warmth varies from winter to summer less probably than in all places in the lowlands except the tropical. The summers are relatively cool, and the winters not nearly so cold as would be supposed from the air temperatures. That climate which produces the greatest stimulation together with the greatest conservation of energy is the high mountain climate of the temperate zone, with its small amount of wind. We know no other climate which unites in itself these two peculiarities of stimulation with the sparing of energy in the same favourable manner. The old practical experience of the healing power of the high mountain climate has gained its scientific explanation through the results of the researches of recent years.

To sum up, rarefaction of the air, temperature of the air, dryness of the air have smaller effect in summer; movement of the air, and particularly radiation, have greater. Freedom from microbes and dust is maintained throughout all seasons. Ionization of the air is greater in summer. The most important climatic factor, the demand for warmth (amount of cooling power), is in summer smaller than in winter, and this agrees with the facts known empirically that weaker individuals are acclimatized more easily in summer than in winter, and therefore can derive more benefit from a cure in summer than from one in winter.

Therapeutic Considerations.

In view of these facts it will be readily understood that in the climate of mountains we have a very active therapeutic agent if applied in the proper manner. The human body is provided with a heat-regulating mechanism, which enables the body to preserve under all conditions (except, of course, impossible ones) a uniform temperature. The body heat is provided by food; the food supplies the energy which is used up in the muscles, and is converted into heat in the muscles. Heat is removed from the body by radiation, convection, and evaporation. The metabolism of the body varies with climatic conditions, and is increased by conditions which favour rapid heat removal. In warm climates heat is removed more slowly from the body than in cold climates, and consequently a warm climate tends to favour the feeble and the old, who are unable to produce the necessary

metabolic reactions for the more strenuous conditions. On the other hand, in the colder, drier climates the more robust, who possess sufficient resisting power, and who are able to react to the severer and more exacting conditions of such climates, gain health and strength, and are enabled to fight more successfully than elsewhere certain diseases to which they have been subject.

The late Dr. Huggard, of Davos-Platz, Switzerland, formulated three fundamental principles, which he designated "The Three General Laws of Climate."

1. The first law, or law of climatic demand: "The chief physiological influence on climate lies in the demand for metabolism, a demand ranging from an amount so great to an amount so small that at each extreme of the scale the adaptive power of the human machine is taxed to the utmost."

2. The second law, or law of individual response: "The physiological optimum of climate, the heat demand corresponding to that degree of functional and nutritional activity most favourable to the well-being of the organism, is not absolute, but is relative to the individual power of response."

3. The third law, or law of local requirement: "The climatic features most favourable to the organism as a whole may lack the qualities most favourable to the morbid local condition, or even may have a directly injurious action on the diseased part."

In the case of pulmonary tuberculosis, the best cases for treatment in the mountains are young or middle-aged subjects of fairly good general constitution, possessed of sufficient resistance and power of reaction necessary to respond properly to the increased rate of metabolic activity which occurs at that altitude. This type of case almost invariably does well. General nutrition and health improve, and the progress of the disease is soon arrested.

There is, however, another type of case unfortunately met with only too often in the High Alps. A patient with feeble circulation, flabby muscles, poor digestion, and a low level of general nutrition, strength, and vitality, often comes to the mountains, even against medical advice, under the impression that the air of the mountains has some special curative effect. A person of this type, who can just manage to live comfortably in the plains on the smallest amount of metabolic change which his system can sustain, will quickly lose ground in the mountains. His power of response to the more exacting conditions of mountain climate proves insufficient. Such cases should be sent back without delay to lower altitudes and less strenuous surroundings if disaster is to be avoided. The reactive power and tissue change is much more active in the young and middle-aged than in the feeble and the old, and it is therefore the young and middle-aged, so long as their general condition is fairly good, who do best in a mountain climate.

It is quite an error to think that the climate of the high mountains is only advantageous to patients in the winter-time. Clinical observation has made it clear to us that the summer is at any rate equally as good, and in the opinion of many of the medical men in Davos with wide experience patients actually derive more benefit and get quicker recoveries in the summer months than they do in the winter. Once a case is diagnosed and thought to be a suitable case for the mountains, it is surely better to send him out at once and not wait until the winter is started. This statement must be qualified, however. If the patient is in an active state of illness, with high fever, it is better for him to rest in bed at home until the more active signs have disappeared. The majority of patients who come to the Alps for the purpose of getting cured from tuberculosis do not stay long enough, from three to six months being an average sojourn, even with persons who can well afford to spend the time and money. The best results are obtained by those who stay, say, a complete year, including two winters, with perhaps a short period of change of environment from time to time. Whilst it may take a comparatively short period for a marked improvement of the general health to take place, a much longer time is required for the disease to arrive at a stable state of healing. If this time is not given before returning to more or less ordinary conditions of life, a relapse is only too painfully common. Another danger of returning home to big towns and crowded cities is the liability to contract secondary or catarrhal infections. These infections appear to be caused by microbes which belong to the "filter-passing" group. Whilst producing themselves a transitory febrile catarrh of the respiratory organs, they at the same time lower the resistance and so expose the sufferer to secondary infections—*e.g.*, by the pneumococcus, etc.—and to any tuberculous infection already present in the lungs. How many patients who have done well during the winter in the Alps have gone down-hill through these catarrhal infections caught by going home too soon! Patients should not go home for the summer, but stay in the Alps, living the outdoor life until the cure is so far complete that they can successfully stand up against catarrhal infections and the greater excitement, stress, and fatigue of home life.

In summer in the Alpine health resorts ultra-violet rays are far stronger than in winter, and the skyshine there is much richer in ultra-violet rays; the patient can be exposed to this and cool air in full daytime, or to the weaker sun or cool air of the early morning, and thus reap the benefit without running any risk of overdosage from these health-giving rays.

The high evaporative power of the Alpine air continues to act in summer beneficially on the lungs. The air remains pure and free from the irritative dust and smoke of cities; the lovely scenery, the beautiful

flowers, and the charm of walks through pine-woods in the Alps help to make the patient happy; while resting in the shade is delightful. While the cool Alpine air stimulates appetite, the absence of high wind protects the patient from the strain of too high a cooling power, and from the fatigue of having to walk against the wind. He can wear very light clothing, and has to suffer none of the extreme changes of weather endured at home.

STANDARDIZED TECHNIQUE IN RADIOGRAPHY OF CASES OF PULMONARY TUBERCULOSIS.

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RADIOGRAPHY is now universally recognized as a valuable aid to diagnosis in suspected cases of pulmonary tuberculosis, and in very early cases, with no physical signs, is often the only means by which the diagnosis may be established. In many early cases a radiograph is indispensable. At the same time a bad or indifferent radiograph of the chest is worthless from a diagnostic point of view, and often misleading. Frequently a patient arrives in a sanatorium proudly producing a negative, which is an appalling daub, showing the ribs with dense black shadows between, and of course absolutely valueless. There is now no excuse for bad chest radiography, as, with the simplicity of the modern apparatus, good results are within the reach of all practitioners. I shall show later that the medical man need have no hesitation, either on the score of expense or lack of accommodation and specialized knowledge, in carrying out his own chest radiography.

A good chest radiograph should include the apices of the lung and the whole of the diaphragm. It should also show very clearly and sharply the fine tracery of the connective and interstitial tissue of the lungs; the roots should appear as fine branching lines and not as clogged shadows. The spinal column should not be visible through the heart shadow. This is an important point. If the vertebræ are discernible through the heart shadow, it may be taken as evidence of faulty technique: either the tube has been too hard or the negative over-exposed. Too much contrast is to be avoided. A negative which has a dense and blurred appearance is of little value. I have seen chest radiographs in which the spaces between the ribs were almost

as black as the parts on which there was no image, and in which all pathological detail was obscured. I now proceed to a consideration of the apparatus and technique necessary for the production of reliable chest radiographs.

Apparatus.—The old induction coil with mechanical interrupter and gas-tube was rather a complicated and cumbersome piece of machinery, which required the supervision of a skilled operator. This type of apparatus is now almost obsolete. The advent of the radiator Coolidge tube (which rectifies its own current) made it possible to reduce the size and complicated switching mechanism of the high-tension transformer, and this type of unit is now largely used by private practitioners on the Continent. The plant is simplicity itself; there are no revolving parts to get out of order, no complicated switching apparatus, no noise, and very little floor space is required, no more, in fact, than is required for the average instrument cupboard. At the same time it is a powerful apparatus. A tube-stand is usually fixed to the machine, and the only other accessory required is a wooden support against which the patient may lean during the exposure. The apparatus necessary for the production of a chest radiograph is therefore neither costly, complicated, nor cumbersome, and is capable of producing first-class negatives.

The X-ray Tube.—In the days of the "gas" tube, radiography was certainly a very difficult and complicated business. The quality of the rays depended largely on the degree of vacuum in the tube, and, as this was by no means stable, it can be readily seen that constant results were impossible to obtain.

The introduction of the Coolidge tube considerably simplified the work of the radiographer, as the quality of the rays depended not on an unstable vacuum, but on the degree of heat of an incandescent cathode, and the voltage applied to the tube. It will therefore be understood that the radiographer was then able to control the penetration of the X-rays to the minutest degree, for, so long as the heating current of the cathode and the voltage applied to the tube remained constant, the quality of the rays remained the same, and he could duplicate his results at any time. The first Coolidge tube was not widely used for chest radiography, as it was found that it did not give such a sharp picture as the old "gas" tube. One often hears this statement made at the present time, but I may say here that it is absolutely unfounded, and beautifully sharp radiographs are obtainable with the modern Coolidge tube. There has recently been placed upon the market an all-metal tube of the Coolidge type, which gives extremely sharp results, which I do not think could have been obtained with the old "gas" tube.

Technique.—The technique must be standardized if results are to be

duplicated, as it is useless to try to compare two radiographs of the chest which have been taken under different conditions. The radiographer should spend a few hours in finding out the switch settings of his apparatus for the penetration of the tube, etc., required for a chest radiograph. The settings should be noted down, and all chest cases should be radiographed under the same set of conditions. Never vary the penetration of the tube. A thick subject should be given a little more exposure, and a thin subject a little less. If these suggestions are followed, radiography of the chest becomes as simple as taking a snapshot with a Kodak.

Films.—The glass X-ray plate is now a thing of the past. The modern method is the X-ray film sensitized on both sides. The film should be large enough to take in the apices and show the complete curve of the diaphragms. A useful size is 14 by 17 inches.

Intensifying Screens.—In former years the intensifying screen was not used for radiography of the chest, as the screen gave a mottled appearance to the negative, due to the grain of the fluorescent material used in the screen. The modern screen is now practically free from grain and gives a clear, sharp negative. An important advantage of the intensifying screen is that it acts as a partial filter of secondary radiation. Secondary rays are produced in the patient's body and give rise to fogging of the negative and lack of detail and sharpness; the thicker the subject the more pronounced are these scattered or secondary radiations. The scattered or secondary rays are much weaker than the primary beam of X-rays coming direct from the tube, and are largely absorbed by the supporting material of the intensifying screen. The film is placed between two screens in a rigid cassette. It is important that complete contact be obtained between the film and the screens. The intensifying screens must be kept scrupulously clean and should be dusted with a fine camel-hair brush before the film is placed between them. The screens should never be kept in the dark room, as there is a danger of their being splashed with developer or fixer. If this happens it will ruin the screen, as developer stains are impossible to remove and will show on the negative as white spots.

Penetration of the Tube.—The quality of the X-rays used is the most important factor in chest radiography. Using a "hard" ray, the early tuberculous foci may be completely penetrated, and very little, if any, shadow thrown on to the film. If a very "soft" ray be employed, the resulting radiograph will be so dense and black that it will be very difficult to distinguish any abnormality. There are various methods of measuring the quality of the X-rays, such as the kilovoltmeter, alternative spark gap, and the penetrometer. It has been previously shown that the penetrating power of the ray depends principally on the voltage applied to the X-ray tube; it is therefore obvious that the most

efficient and simple method of estimating the penetrating power of the rays is to measure the secondary voltage applied to the tube, by means of the kilovoltmeter. This is an instrument similar to the ordinary voltmeter, and can be installed on the switch table. Below is given a table of comparison of three different methods of measuring the hardness of the tube, showing which rays are suitable for radiography of the chest.

TABLE INDICATING MEANS FOR TESTING TUBE.

	Too soft.	Suitable for Chest Radiographs.		Too Hard.	
Kilovolts (root-mean-square)	40	45	50	60	70
Spark-gap (between points)	3½ ins.	4 ins.	4½ ins.	5 ins.	7·3 ins.
Wehnelt penetrometer	5-6	7	7·5	8-9	10-11

Milliampèrege.—The exposure varies directly as the current passing through the tube; e.g., if a negative be obtained at a distance of 39 inches, with a penetration of 45 kilovolts and a current of 20 milliampères in one second, then if the distance and penetration remain constant, the exposure may be halved by passing a current of 40 milliampères. Therefore as much milliampèrege as the apparatus can stand should be passed through the tube.

Distance of Tube from Film.—In order to avoid distortion of the heart shadow, the tube should be at least 39 inches from the film. If this distance is halved, it will be found that the heart shadow is spread over the lower part of the negative, thus obscuring any abnormality which may be present in the hilus. It should be remembered, however, that the intensity of the rays varies inversely as the square of the distance from the anticathode to the film.

Centring the Tube.—An anatomical point, such as one of the vertebræ, should be selected as a means of centring the tube. If a second radiograph of a case of tuberculosis with a cavity be taken at a subsequent date, with the tube centred over some other point, the cavity will be demonstrated in an apparently different position.

Exposure.—The penetration should be kept constant and the exposure varied according to the thickness of the subject. With a secondary voltage of 45 kilovolts, a current of 40 milliampères, and a distance of 39 inches, it will be found that for a chest of average thickness the exposure will be about half a second. In this respect I would mention

that an automatic time-switch is of great advantage, as it allows one to duplicate the exposure to a fraction of a second.

Development of the Negative.—Although extreme care is taken as regards the technique of exposure, the negative may be absolutely ruined by careless and faulty development. It should be remembered that the development of an X-ray film is a chemical reaction, and the same care and attention to detail should be given to the preparation of the developer and the actual development as is observed in an experiment conducted in a chemical laboratory. The dark room and developing dishes should be scrupulously clean, and the developing and fixing solutions kept at the proper temperature. A metol-hydroquinone developer is recommended, and a good formula is that of Messrs. Kodak for the development of their duplitized films. As hydroquinone becomes inert at a temperature below 50°F ., it is necessary to keep the developing solution at a higher temperature, preferably 65°F . A cold developer gives a weak, thin negative. Still higher temperature will destroy the quality of the negative. Using Kodak films a correctly exposed negative will be fully developed in five minutes, further development will only produce fog, and the resulting radiograph will be of poor quality. It is advised that the time and temperature method of development be adopted, and that all films be developed for five minutes at a temperature of 65°F ., thus standardizing the development. The developing solution should not be used after it begins to show signs of oxidization. Two pints of normal developing solution will only develop four 14 by 17 inch films; after this number have been developed fresh solution should be prepared. An acid fixing bath is recommended as this prevents staining of the negative.

Examination of the Negative.—The radiograph should not be examined by holding it up to ordinary daylight, as any minute pathological detail may be missed. The correct method of examination is to place the film in an illuminated viewing cabinet containing a ground-glass screen.

Printing the Radiograph.—As the skill of the radiographer is often judged by the finished print, it is as well to give some attention to this. To my mind the ideal method is the reduced diapositive on film, with a piece of matt film behind. The diapositive can be examined by daylight, the matt film diffusing the light, and it will be found that the minutest detail on the radiograph is faithfully reproduced, which was not the case with the paper print.

Summary.—The suggested technique for producing a chest radiograph is therefore as follows:

Fourteen by seventeen inch film between two intensifying screens. Distance of tube from film 39 inches. Centre the tube over a selected point. Adjust the voltage until the kilovoltmeter shows a reading

45 kilovolts. Advance the heating current rheostat until the milliampèremetre shows a current of 40 milliampères passing through the tube. Set the automatic time-switch for a half to one second as required. Close the transformer switch and make the exposure. Develop for five minutes at 65° F. Fix in acid fixing bath.

The foregoing remarks are not to be taken as a hard-and-fast rule, as conditions will vary according to the apparatus employed, but it is hoped that they may be of some use in aiding practitioners to develop a standardized technique in radiography of the chest.

ASSOCIATIONS AND INSTITUTIONS.

THE MOUNT VERNON HOSPITAL.

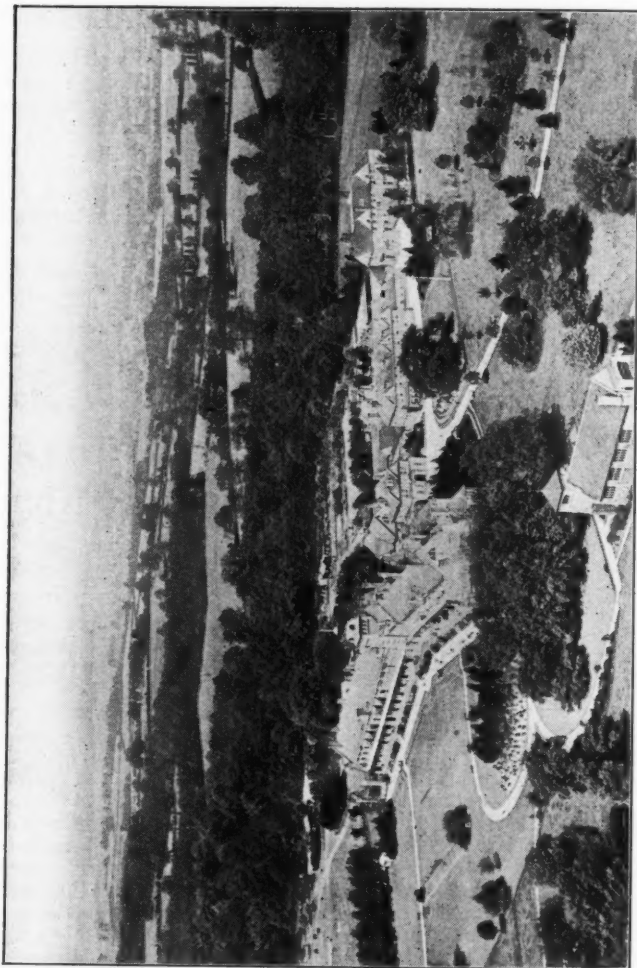
THIS institution, founded in 1860, has recently issued its sixty-sixth Annual Report, which presents many features of interest. Mount Vernon Hospital was one of the first of the large voluntary hospitals for consumptives to provide adequate means for the open-air treatment of tuberculous cases. In 1900 large open galleries were established at its London Hospital at Hampstead (now the headquarters of the Medical Research Council). In 1902 the late Princess Christian laid the foundation-stone of the magnificent country branch at Northwood, Middlesex (where the



MOUNT VERNON HOSPITAL.
View of the front of the main building.

in-patient work of the institution is now concentrated). The central offices, out-patient department, and light clinics are at 7, Fitzroy Square, from whence full particulars can be obtained regarding admission of patients. Recently considerable development has taken place in regard to the treatment of cases by artificial light. There are installations both at Fitzroy Square and at Northwood, so that both out-patients and in-patients can undergo such suitable actinotherapy as they require. Through the generosity of the *Daily Mirror* £1,000 has been donated to the hospital from the Queen Alexandra Memorial Fund, and in accordance with their desire has been designated The Bernard Baron Light Department—Mr. Baron's gift to the fund being specially earmarked for the extension of light treatment, has permitted of a valuable development of actinotherapy at the London centre at 7, Fitzroy Square. A ball organized by Lady Louis Mountbatten

held in the spring provided a further addition to the funds of the hospital of over £3,000. At Northwood wards exist for the treatment of all forms of tuberculous disease. There are special wards for children, and during recent years this provision for the treatment of all



MOUNT VERNON HOSPITAL, NORTHWOOD, MIDDLESEX.
General view of hospital and grounds taken from an aeroplane

kinds of tuberculous trouble in young subjects under country conditions and with ample means for carrying on artificial light treatment at all times of the year, and particularly during winter months, has proved of invaluable service in restoring many tuberculous boys and

girls. The Mount Vernon Hospital is one of the few voluntary hospitals still remaining where consumptive cases and sufferers from all forms of tuberculosis may receive every necessary kind of treatment. Patients are admitted from all parts of the country. In addition to the medical superintendent, there are two resident medical officers, and a representative visiting staff, consisting of physicians, surgeons, laryngologist, radiologist, and actinotherapist. There is, of course, a large nursing staff. Patients are therefore sure of having the best care which modern science and philanthropic enterprise can provide. The terms on which patients can be admitted are comparatively low. The nearness of the hospital to London and its ready access makes the visiting of patients by their friends easy, and thereby adds greatly to their happiness. There is no other large country hospital of this kind which can be so speedily reached from London. There are large numbers of trains from Baker Street and Marylebone to Northwood, the distance being fifteen miles, and the journey takes only about twenty minutes. A copy of the Annual Report, with list of governors and subscribers and statistical tables, will be sent on application to Mr. W. J. Morton, Secretary, on receipt of 1s., post free.

The Rockefeller Institute for Medical Research is accomplishing a notable service for scientific workers in all lands by its periodical issue of "Studies from the Rockefeller Institute for Medical Research." We have received several of these volumes recently. They consist of valuable reprints, conveniently grouped under systematic headings—Pathology and Bacteriology, Biophysics, Chemistry, General Physiology, Animal Pathology, and work from the Hospital of the Rockefeller Institute.

"The Forty-first Annual Medical Report of the Trudeau Sanatorium and the Twenty-first Medical Supplement for the Year ending October 31, 1925, together with the Ninth Collection of the Studies of the Edward L. Trudeau Foundation for Research and Teaching in Tuberculosis," contains articles which will be of value to tuberculosis workers in this country as well as America. There are communications on Artificial Pneumothorax, Experimental Tuberculous Meningitis, Immunological Studies in Tuberculosis, Intestinal Tuberculosis, and the Effects of Ultra-Violet Light Treatment.

NOTICES OF BOOKS.

WORK FOR THE TUBERCULOUS.

DR. W. BOLTON TOMSON, Vice-Chairman of the Tuberculosis Care Committee for the Borough of Hastings, has just published a valuable brochure containing practical suggestions regarding employment for tuberculous subjects.¹ It merits the serious consideration of all who seek to provide suitable conditions of remunerative work for consumptives. Dr. Tomson first points out that of all the duties pertaining to a Tuberculosis Care Committee the question of finding suitable employment for male or female patients, trained or untrained, able and willing to work, is a task peculiarly difficult, and he admits that "often it is wellnigh impossible." There are various obstacles to be overcome. In studying the position, it is necessary first to consider the case of the individual patient and then the attitude of the employer, the public, and the various restrictions that have to be encountered. With regard to the latter, one of the most important is that which arises in connection with the National Health Insurance Act of 1924. Dr. Tomson desires such legal amendment as would allow permanently or partially disabled tuberculous cases to undertake such work as is within their powers without loss of their "disablement benefit," which generally ranges from 7s. 6d. to 8s. 6d. a week. If this class of case is to be effectively helped some form of subsidy would seem to be essential. Dr. Tomson's booklet is of special interest and value on account of its practical suggestions. For female subjects unpicking and cleaning of worn, disused, and unwanted woollen and silken garments provides a remunerative occupation; particulars are given regarding means for the scouring of wool and silk preparatory to re-using. For male patients, rabbit-farming is advocated and details are given, together with illustrations, of suitable sheds and hutches. A suggestive section is devoted to "Poor Man's Pig Keeping," and ways and means are indicated where a tuberculous ex-patient may conduct piggeries on profitable lines. We would commend Dr. Tomson's unpretentious but thoroughly practical little work to the consideration of tuberculosis officers, members of tuberculosis care committees, and all who are anxious to assist tuberculous cases in becoming partially or wholly self-supporting.

TUBERCULOSIS AND WORKERS.

Sir Thomas Oliver in his recently issued study of the physical well-being of the workers—a concise, informing, and interesting manual on the relationship of various trades and health—devotes special attention to a consideration of the influence of dust and the development of tuberculosis

¹ "Notes and Suggestions on the Finding of Employment for the Tuberculous by Tuberculosis Care Committees," by W. Bolton Tomson, M.D. Pp. 27. London: Baillière, Tindall and Cox. 1926. Price 1s.

among certain classes of industrial workers.¹ While dusty occupations are particularly liable to lead to pulmonary tuberculosis, "the malady occurs with considerable frequency in persons who are following indoor occupations carried on in overheated workshops wherein large numbers of persons are congregated, and the ventilation is imperfect. The high mortality rate from pulmonary tuberculosis in persons following these indoor trades raises the question how much is due to the nature of the occupation itself, how much to the surroundings in which the work is carried on, including the presence of infected persons." An excellent summary is provided regarding the essential features of tuberculosis, particularly in regard to industrial conditions. Medical officers of health and tuberculosis officers and all interested in the well-being of workers will be well advised to read Sir Thomas Oliver's book. There is a suggestive section on injury and tuberculosis, from which we quote the following: "When tuberculosis has followed injury it would at first sight appear as if the injury was the first link in the chain of morbid events. But are we quite sure of this? It is known that in over 70 per cent. of the bodies of persons dying from all causes, including accidents, there are signs of healed or latent tuberculosis. It seems therefore the more probable when tuberculosis follows upon an injury, that bacilli, which have been lying dormant, have become roused to fresh activity, or that the accident has reduced the resistance of the tissues injured, and caused them to become a readier prey to the special organism." Sir Thomas Oliver's manual has been written primarily for thoughtful members of the general public interested in medico-sociological problems connected with industrial occupations; it is concise, lucid, and conveys in not too technical language information which will be of interest and service to employers and employees and all intelligent members of the community.

PNEUMOCOCCAL INFECTIONS.

The so-called pneumococcus in its numerous varieties and different types of pneumococcal disease is answerable for much morbidity and a heavy mortality. We have still much to learn regarding pneumococcal affections, but a remarkably effective summary of our present knowledge has been provided by Cotoni, Truche, and Raphael, and an excellent English translation of this comprehensive French monograph has been prepared by Drs. Page and Morton.² This is a work which deserves the serious study of both physicians and surgeons, and we would particularly commend it to the consideration of tuberculosis officers and medical superintendents of sanatoria. The monograph is divided into three parts. In the first all the characteristics of the

¹ "The Health of the Workers," by Sir Thomas Oliver, M.A., M.D., D.Sc., LL.D., D.C.L., F.R.C.P., Professor of the Principles and Practice of Medicine, University of Durham and College of Medicine, Newcastle-upon-Tyne. Pp. 226. London: Faber and Gwyer, Ltd., The Scientific Press, Russell Square, W.C. 1925. Price 2s. 6d.

² "The Pneumococcus and Pneumococcal Affections," by L. Cotoni, C. Truche, and Mlle. A. Raphael. English Edition by D. S. Page, M.A., M.D. (Cantab.), D.P.H., Assistant Pathologist to the City of London Hospital for Diseases of the Heart and Lungs, Victoria Park; and Eva Morton, M.R.C.S., L.R.C.P., Late Assistant Medical Officer, Grove Hospital, Tooting. Pp. viii + 218, with 18 tables, 40 charts, and 6 figs. London: John Bale, Sons and Danielsson, Ltd., 83-91, Great Titchfield Street, Oxford Street, W.1. 1924. Price 16s.

pneumococcus are described in detail, with full particulars regarding culture, pathogenicity, types, and preparation and properties of anti-pneumococcal sera. In part two is set forth an exposition regarding the habits of the pneumococcus, together with accounts of the various diseases of pneumococcal origin. Part three is of special interest to the clinician, for here is given an excellent summary regarding the treatment of pneumococcal diseases by serotherapy, prophylactic vaccination, and bacteriotherapy and chemotherapy. There is a valuable bibliography, but no index.

TUBERCULOUS HIP DISEASE.

Mr. George Perkins's Robert Jones Prize Monograph, published under the auspices of the British Orthopaedic Association, is a valuable addition to modern literature dealing with the diagnosis and treatment of tuberculous disease of the hip.¹ The author rightly insists on the importance of early recognition of disease and furnishes an excellent account of the signs and symptoms which should be looked for when trouble is commencing. Pain is not, as is often stated, an early and constant symptom of tuberculosis of the hip joint; it is "a relatively late symptom and often absent, especially in patients seen within a short while of the onset of the disease." Radiography is often of great value to the surgeon, as is clearly indicated by the excellent radiograms reproduced in this monograph. The chief portion of Mr. Perkins's work is devoted to a detailed and well-illustrated account of treatment. Mr. Perkins has introduced a fixative appliance which he designates the Pyrford hip frame, and which appears to be a compound of the Bradford spinal frame as modified by Gordon Pugh of the Queen's Hospital for Children, Carshalton, and Sir Robert Jones's abduction frame. The most suggestive and original section of this practical book is the one in which a summary of late and final end results of treatment is given, based upon the author's personal study of fifty cases. The volume is admirably got up in what we now look upon as the customary form for the Oxford Medical Publications.

MANUALS FOR MEDICAL ADVISERS AND WORKS OF REFERENCE.

Sir William Hamer and Dr. C. W. Hutt are responsible for the revised and extended version of the well-known "Manual of Hygiene," published by Dr. Hamer as he then was in 1902.² It is an elaborate work, intended to serve as a complete textbook for those seeking to obtain a Diploma in Public Health. The present authors have succeeded in producing an authoritative work on all aspects of public health, and have secured the co-operation of a number of experts who are responsible for new chapters or the revisions of various sections.

¹ "The Diagnosis Treatment and End Results of Tuberculous Disease of the Hip Joint," by George Perkins, M.Ch. (Oxon.), F.R.C.S. (Eng.), Assistant Surgeon to the Royal National Orthopaedic Hospital, etc. Pp. x+118, with 32 illustrations. London: Humphrey Milford, Oxford University Press, Amen Corner, Warwick Square, E.C. 4. 1926. Price 6s.

² "A Manual of Hygiene," by Sir William H. Hamer, M.D., F.R.C.P., D.P.H., and C. W. Hutt, M.D., D.P.H., Medical Officer of Health, Metropolitan Borough of Holborn. Pp. xi+821, with 94 figures. London: Methuen and Co., Ltd., 36, Essex Street, W.C. 1925. Price 30s.

The volume consists of fifteen chapters—air, water, soil, food, the collection, removal and disposal of refuse, dwellings, schools and hospitals, infection and immunity, infectious diseases, disinfection, vital statistics, maternity and child welfare, venereal disease, school hygiene, and sanitary administration and law. The chapter on Tuberculosis is the work of the late Dr. James Niven, of Manchester. This is a remarkably complete and highly suggestive and serviceable account of the tuberculosis problem as it appears to the student of public health. After reference to outstanding historical events and a useful summary of the work of the three Royal Commissions on Tuberculosis, Dr. Niven discusses *Ætiology* and Factors supposed to favour the occurrence of tuberculosis, and indicates the various points which must be understood by the Medical Officer of Health in regard to organization and administration of an effective tuberculosis service and practical measures for dealing with affected cases. The article concludes with the following words: "By the creation of schemes for the treatment of tuberculosis an immense stride forward has been taken in the campaign against tuberculosis. The appointment of tuberculosis officers, specially qualified and devoted to the administration and study of the disease, has introduced a new and invigorating force. Were his field of vision limited to examination of patients and contacts, and to the administrative work involved in determining the movement of cases, and the condition of domiciliary patients, expectations of the advance to be derived from the new schemes would be partially disappointed. But, even in his capacity of consulting medical officer to practitioners he is bound to exert a powerful influence, quickening up the early diagnosis of the disease, and supplying the deficiencies of the medical schools as regards instruction in a knowledge of signs and symptoms." At the conclusion of the chapter is a list of dated circulars relating to tuberculosis issued by the Local Government Board and the Ministry of Health, together with the following: "In view of the unreasonable alarm felt by the public as to the infectivity of tuberculosis, the Royal College of Physicians, London, issued a statement; *inter alia*, it says when suitable 'precautionary measures' are carried out 'risk of infection is reduced to a minimum'; further, that 'no risk is incurred by living in the immediate neighbourhood of institutions for the treatment of tuberculosis which are properly conducted.'"

Mr. Duncan C. L. Fitzwilliams has issued an elaborate and well-illustrated monograph on morbid conditions involving the human breast. It is a work which should have the attention of general practitioners and will be of service to all medical advisers and particularly valuable to surgeons.¹ The opening chapters deal with the development, anatomy and abnormalities of the breast, and then follow a series of carefully constructed comprehensive studies regarding its various diseases, special attention being devoted to both simple and malignant growths. Readers of this journal will be interested in the excellent chapter dealing with tubercle c. the breast. This was first

¹ "On the Breast," by Duncan C. L. Fitzwilliams, C.M.G., M.D., Ch.M., F.R.C.S. (Ed. and Eng.), Surgeon in Charge of Out-Patients and Lecturer on Operative Surgery to St. Mary's Hospital; Surgeon to Paddington Green Children's Hospital, and to Mount Vernon Hospital for Tuberculosis. Pp. xv+440, with illustrations. London: William Heinemann (Medical Books), Ltd., 20, Bedford Street, W.C. 2. 1924. Price 30s.

described by Sir Astley Cooper in 1829. Shattock in 1889 provided a bibliography up to that date. The disease is rare. Mr. Fitzwilliams states that tubercle bacilli can be excreted from the breast of a tuberculous subject without any definite lesion being detected in the mammary substance, and it is said that "it is probable that the mammary gland may be one of the normal avenues through which the tubercle bacilli are ordinarily excreted." Cases are on record where nurslings have apparently been infected by the milk of a tuberculous wet nurse. Nearly all the reported cases of tuberculosis of the breast were females. About 50 per cent. occurred between twenty and forty-five years of age. Trauma appears to be a predisposing cause. The commonest form is a nodular tuberculous mastitis, but disseminated and sclerosing types are described and a variety spoken of as mastitis tuberculosa obliterans. Mr. Fitzwilliams provides a suggestive section on the association of mammary tuberculosis with other morbid conditions of the breast. The clinical descriptions are excellent, and in the paragraphs on signs and symptoms it is stated that pain is usually absent until the skin is involved. The lymphatic glands of the axilla are affected in about 60 to 70 per cent. of the cases before skin invasion occurs. Mr. Fitzwilliams favours surgical treatment in association with hygienic measures and the customary procedures for improving the general condition of the patient. The prognosis is said to be excellent. At the close of the chapter a short but serviceable bibliography is given.

Professor J. H. Clark has produced a practical monograph on Lighting, which should be of service not only to Medical Officers of Health, school medical officers, and all interested in the hygienic aspects of the lighting of houses, schools, shops, and factories, but appeal also to engineers, architects, builders, and all thoughtful men and women anxious to provide good conditions for all classes of workers.¹ The book is based on courses of instruction provided for students preparing for the Doctorate in Public Health at the School of Hygiene and Public Health of the Johns Hopkins University. The problems of illumination presented are mainly those connected with electric lighting. In a series of fifteen chapters such subjects are dealt with as units and standards, measurement of illumination, reflectors, glare, conditions for visual efficiency, lighting of schools, factory lighting, exterior lighting, occupational eye diseases from low illumination, pathological effects of radiant energy on the eye, occupational eye diseases attributable to excessive light and heat, and protective glasses and glasses for refraction errors. The work is a thoroughly practical one and effectively illuminated. Many hospitals and sanatoria are unscientifically lighted and consequently the patient suffers needless inconveniences. We would commend a study of this informing and sensible work to the notice of those who construct and those who conduct places where patients dwell. The section on the lighting of schools is of exceptional interest and value, and merits the careful study of all who are in any way responsible for the lighting of institutions in which young people are taught or engage in play or work.

¹ "Lighting in Relation to Public Health," by Janet Howell Clark, Ph.D., Associate Professor of Physiological Hygiene in the School of Hygiene and Public Health of the Johns Hopkins University. Pp. 185. Baltimore, Maryland, U.S.A.: Williams and Wilkins Company. 1924. Price \$4.00.

Under the designation of "The Gardener's Calendar," Mr. T. Geoffrey W. Henslow has issued a practical manual, which will be appreciated by all who desire to prove themselves true lovers of horticulture and expert workers in a garden.¹ It is just the sort of guide and record book which many a tuberculous subject taking up the life of a gardener will know how to appreciate. On the right-hand pages are directions for the conduct of work for every day of the year, while opposite are blank pages for notes and register of work carried out. The idea is excellent and effectively carried out.

"The Medical Annual" is now in its forty-fourth year, and the 1926 issue fully maintains the high standard set by its predecessors.² The Editors have been ably supported by the thirty-four contributors, and the Publishers have carried out their part in the customary effective style, which for convenience of arrangement and excellence in paper, printing, and illustrations can scarcely be surpassed. There are several contributions dealing with tuberculosis. Dr. J. Priestley writes on Prevention as viewed from the standpoint of a Medical Officer of Health; Dr. W. H. Wynn has a lengthy summary of Recent Work relating to Tuberculosis of Larynx and Lungs; Dr. Reginald Miller deals with Pulmonary Tuberculosis in Childhood; Sir W. I. de C. Wheeler treats of Surgical Tuberculosis; Dr. E. Graham Little has a short paragraph on Tuberculosis of the Skin. Dr. C. Thurston Holland furnishes a serviceable section on X-ray Diagnosis. It may also be noted that the advertisement pages of this popular Annual prove very useful for reference.

The ninth edition of Squire's well-known classified work on the Pharmacopœias of the London Hospitals is now available, and furnishes means for an exhaustive comparison of the prescriptions employed by present-day leaders in the medical profession.³ The formulæ as used in thirty-one of the hospitals of London, including the French Hospital and hospitals for children, are presented in convenient alphabetical groupings. The volume is one which will be invaluable in all hospitals, sanatoria, and dispensaries, and will be appreciated by general practitioners.

We have recently received a copy of E. Merck's Annual Report⁴ in its familiar form and arranged alphabetically as in pre-war years with references as foot-notes. The work is invaluable as a reliable summary to new preparations and drugs. There is a good General Index, a serviceable Index of Diseases, Symptoms and Indications for Treatment, and a Bibliographical Index. An English edition of Merck's

¹ "The Gardener's Calendar: A Garden Guide for Every Day of the Year," by T. Geoffrey W. Henslow, M.A., F.R.H.S. Pp. 126. London: Dean and Son, Ltd., Debrett House, 29, King Street, Covent Garden, W.C. 2. 1925. Price 2s. 6d.

² "The Medical Annual: A Year Book of Treatment and Practitioner's Index," edited by Carey F. Coombs, M.D., F.R.C.P., and A. Rendle Short, M.D., B.Sc., F.R.C.S. Forty-fourth year. Pp. ciii+616+159. Bristol: John Wright and Sons, Ltd. 1926. Price 20s.

³ "The Pharmacopœias of Thirty-one of the London Hospitals, arranged in Groups for Comparison except the Children's and French which are placed in the Addenda," by Peter Squire and Peter Wyatt Squire. Ninth edition, revised by William S. Boyack. Pp. 451. London: J. and A. Churchill, 7, Great Marlborough Street, W. 1. 1924. Price 12s. 6d. The volume can also be obtained on application to Squire and Sons, Ltd., 413, Oxford Street, W. 1.

⁴ Merck's Annual Reports are issued from the Scientific Department of E. Merck, Chemical Works, Darmstadt, Germany. The English Agents for the Merck specialities are John Bell and Croyden, Ltd., 50, Wigmore Street, W. 1.

Annual Report is now being issued in quarterly parts, and will, we understand, be sent free of charge to any medical adviser desiring a copy.

A carefully prepared work on present-day views and practice, relating to the therapeutic use of vaccines, sera, phylacogens, gland substances, and protein sensitization, has been issued by the well-known firm of Parke Davis and Co.¹ Manifestly much discrimination and scientifically direct care has been taken in the preparation of this authoritative and serviceable manual, which we commend to the consideration of all medical advisers desirous of keeping up to date in regard to modern methods of therapy.

Sir Robert Philip's address, delivered at the Fourth Conference of the International Union against Tuberculosis, at Lausanne, appeared in the *Edinburgh Medical Journal* for September, 1924, and is available in brochure form.²

Dr. T. Stephenson's little work on "Incompatibility in Prescriptions"³ has proved of much service both to doctors and dispensers. A revised edition is now available and should be kept at hand for reference. It contains a particularly serviceable table of incompatibilities.

Volume XLI. of the Transactions of the American Climatological and Clinical Association contains a delightful illustrated article by Dr. Vincent Y. Bowditch on "Reminiscences of Student Life in Europe in 1879-1881," together with numerous articles of clinical interest, and including several relating to pulmonary tuberculosis. Dr. D. A. Stewart has a suggestive communication on "The Internal Secretions of the Sanatorium."

"The Anglo-American Year-Book" is a valuable work of reference for men and women of affairs on both sides of the Atlantic.⁴ In addition to its Directories, residential, commercial, etc., and its informing "Who's Who," it contains a vast amount of data regarding institutions of various kinds, and all matters likely to be of interest and service to an American visiting or residing in Great Britain. The work is a model of effective condensation and orderly arrangement of practical matter.

The Public Health Department of the Corporation of Glasgow issued an illustrated booklet on "The Glasgow Tuberculosis Scheme," in connection with the Twelfth Annual Conference of the National Association for the Prevention of Tuberculosis.

¹ "Biological Therapy, including Vaccine Therapy, Serum Therapy, Phylacogen Therapy, Gland Therapy, and Diagnostic Proteins." Published by Parke, Davis and Co., 50, Beak Street, W. 1. This manual is issued to members of the Medical Profession and a copy will be sent free of charge to any medical practitioner making application.

² "The Effects of the Anti-Tuberculosis Campaign on the Diminution of the Mortality from Tuberculosis," by Sir Robert Philip, M.D., LL.D. Pp. 45. Edinburgh: Oliver and Boyd, Tweeddale Court.

³ "Incompatibility in Prescriptions and How to Avoid It," by Thos. Stephenson, D.Sc., Ph.D., F.R.S.E., F.C.S., Editor of *The Prescriber*. Pp. 32. Edinburgh: *The Prescriber* Offices, 6, South Charlotte Street. 1925. Price 1s. 6d.

⁴ "The Anglo-American Year-Book, 1926." Edited by H. Russell Amory. Pp. xvii + 504. With frontispiece portrait of the Hon. Alanson Bigelow Houghton, American Ambassador to the Court of St. James's. London: American Chamber of Commerce in London, Inc., Aldwych House, Aldwych, W.C. 2. 1926. Price 15s., or 84.

PREPARATIONS AND APPLIANCES.

THE SHAVING OF CONSUMPTIVE MEN.

SPUTUM from an active virulent case of pulmonary consumption is generally admitted to be the commonest agency whereby tuberculous infection is maintained. Investigations on guinea-pigs have proved that the expectoration coming from quiescent cases engaging in the ordinary life of the world and apparently in good health may contain tubercle bacilli of a very virulent type. Among means for lessening the chance of infection, particularly under conditions of family life, shaving must be counted as specially important. Certainly every consumptive man who is a husband and a father should understand that by complete shaving the risks of infecting others can be considerably diminished. All cases of pulmonary tuberculosis undergoing treatment in hospitals and sanatoria should shave. This is a precaution which should always be taken when advanced cases are being nursed in institutions or in their own homes. It is always wise for tuberculosis officers and medical superintendents of sanatoria to set a good example for patients under their care by shaving completely. There are many forms of razor whereby patients can very easily carry out their own shaving. A particularly effective means is now provided by the new Rolls Razor. Some of the features of this auto-razor are indicated in the accompanying figure. It contains the advantages of the old-fashioned "cut-throat," hollow-ground blade with the modern "safety." It consists of a single hollow-ground blade, with a patent safety guard. There is an ingeniously constructed accompanying hone and strop. The blade is stropped after each shave and honed occasionally as required. These processes are carried out with the greatest ease. The Rolls Razor enables the patient wherever he may be to carry out a perfect shave with the minimum of trouble. There is no worry about buying new blades, and all that is requisite in carrying out a perfect shave is always available. The Rolls Razor is made in London, and can therefore justly claim to be "all-British."¹



THE ROLLS RAZOR.

¹ The Rolls Razor is available in two models: the "Popular" at 25s., and the "Standard" at 30s.; the chief difference between them is that the lid of the case of the former is of hammered metal, while that of the latter is engraved. The mechanical details are identical. Full particulars can be obtained on application to Rolls Razor, Ltd., 1, Charing Cross, S.W.1.

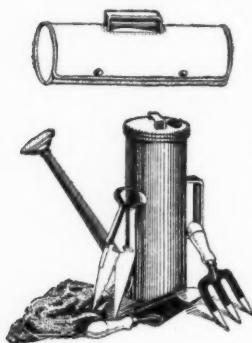
HYGIENIC APPLIANCES AND THERAPEUTIC PREPARATIONS.

Rest in the open with moving air and the benefits of sunlight occupies a foremost position among restorative and ameliorative measures in the treatment of tuberculous and other patients. But it is essential that chairs and reclining couches should be properly designed and so constructed as to provide the maximum of comfort and relaxation. The firm of C. R. Bates are well-known experts in the manufacture of all forms of chairs, and they construct various kinds of folding chairs



THE RECLINING LOUNGE.

and tables specially suited to the requirements of sanatoria and open-air schools. We direct special attention to the RECLINING LOUNGE illustrated in the accompanying figure.¹ It is an ideal appliance for obtaining complete rest in the open, being strong and durable, covered with rot-proof canvas in brown or green, and available in lengths of 4 feet 6 inches, 5 feet, and 5 feet 6 inches. For children as well as for adults this effective contrivance for resting the whole body will be found most effective. The folding of the legs at the head end makes storage easy.



THE "OLLISSET" GARDENING OUTFIT.

The "OLLISSET" GARDENING OUTFIT provides a complete set of tools necessary for use in sanatoria, etc., and it should prove a boon to patients undergoing open-air treatment. The set consists of watering-can (screw-on spout, rose, and lid), trowel, hand-fork, grass-shears, and wash-leather. The outfit can be supplied with or without the leather-bound canvas cover. The whole occupies a very small space, the length being only 15½ inches, the diameter 5 inches, and the weight, which is a very important matter where tuberculous patients are concerned, is only 3 pounds 13 ounces. The

set, open and ready for use, is shown in the accompanying illustration. Wherever a tuberculous patient is to be found the strictest attention

¹ Full particulars regarding the Bates Reclining Lounge can be obtained from the manufacturer, C. R. Bates, Stokenchurch, High Wycombe, Bucks. The prices are 17s., 18s. 6d. and 20s. according to size, and with special rates for quantities.

² The "Ollisset" Gardening Outfit can be obtained from the Ollis Portable Garden Set Co., Wood Side Green, S.E. 25.

must be given to the hygienic collection of all dust. In private houses as well as in hospitals and sanatoria cleansing will be much facilitated by the use of the SQUEEZ-EZY MOP.¹ This novel contrivance is a great improvement on the old-fashioned forms of mop, being simple, effective, durable, and entailing a minimum of labour.

At this time of the year many tuberculous patients, as well as healthy people, living an open-air life, are greatly troubled by the attacks of mosquitoes, midges, gnats, harvesters, sandflies, and other irritating forms of insect life. Among the numerous preparations introduced as prophylactic agents special reference must be made to Evans' ANTI-MIDGE KOLONE.² This speciality has proved of service both at home and abroad, and has found favour with travellers, sportsmen, campers-out, and children. It can be applied to the skin of any part of the body, and does not stain. The odour is pleasing, and it is as clean, fragrant, and refreshing as eau-de-Cologne.

PINEOLEUM INHALANT³ is a pleasing and effective preparation for use in connection with various catarrhal and other morbid states affecting the respiratory passages. It often gives much relief to tuberculous patients who have trouble with nasal, pharyngeal, and bronchial lesions. It can be easily and effectively used with the special nebulizer which is provided by the manufacturers. Bacteriological investigations have shown that this agent inhibits the growth of certain organisms. Its emollient and sedative action is often useful in checking cough.

ISACEN, or diacetyldehydroxyphenylisatins, is a new synthetic non-toxic purgative.⁴ It is a white powder put up in small tablet form. It appears to exert its action by direct stimulation of the large intestine, and does not produce pain or discomfort. It seems likely to be of service for many tuberculous subjects.

¹ Particulars and prices regarding the "Squeeze-Ezy" Mop can be obtained on application to Arthur Smart and Sons, Ltd., 47-53, Bermondsey Street, S.E. 1, sole distributors.

² "Evans' Anti-Midge Kolone" is supplied by Steele and Marsh, Manufacturing and Dispensing Chemists, 6, Milsom Street, Bath.

³ Particulars and specimens of "Pineoleum" will be sent to medical advisers on application to Brooks and Warburton, 40-42, Lexington Street, W. 1.

⁴ Specimens and particulars regarding "Isacen" can be obtained on application to the Hoffmann la Roche Chemical Works, Ltd., 7 and 8, Iodol Lane, E.C. 3.

THE OUTLOOK.

THE FUTURE OF THE TUBERCULOSIS PROBLEM.

SIR ARTHUR NEWSHOLME, in a recent address delivered before the University of Chicago, dwelt in a highly informing and suggestive manner on the tuberculosis problem as it presents itself, particularly in America and this country.¹ After discussing the statistical and other data and the various factors which have exercised influence during recent times in diminishing infection and producing a decline in the prevalence of tuberculosis, Sir Arthur Newsholme deals with lines of future action, in the course of which he suggests the desirability of securing answers to the following elementary questions as needing to be asked respecting any local arrangements for the control of tuberculosis: "How do the number of cases of tuberculosis reported compare with the number of deaths from the disease? How soon after commencing attendance does the practitioner notify his cases? In what number of doubtful cases is consultation arranged between the practitioner and the tuberculosis officer? In how many of the cases notified has a medical examination of the rest of the family been secured? In how many of the cases notified has sanatorium or hospital treatment been provided? Does the number of hospital and sanatorium beds for tuberculous patients equal the annual number of deaths from tuberculosis? During institutional treatment has it been an essential part of the arrangements to instruct and train the patient in the hygiene of his future life? While the patient is away from home, have his domestic conditions been investigated, the condition of health of his family ascertained, and such assistance given as is needed to maintain nutrition, either directly or arranged from collateral sources? After each patient has left the institution, has he been the subject of continued sympathetic visitation and of help to ensure that he has (a) occupation adapted to his physical ability; (b) a separate bedroom; (c) such supplementation of income, when needed, as will secure him from malnutrition." Finally, the following points are emphasized: "1. The objects of all anti-tuberculosis measures are to increase the resistance of mankind to infection, and to reduce the amount and frequency of infection to which mankind is exposed. 2. The amount and frequency of infection are greater in consumptive families; and commonly, owing to poverty and its associated circumstances, the resistance to infection is at its lowest in such families. 3. The age-incidence of mortality from tuberculosis shows that the risk of acute tuberculosis and death is greatest in the first two or three years after birth. Hence the supreme importance of protecting young children against infection. (4) The excessive incidence of tuberculosis in early childhood and the important part played by epidemic diseases in increasing tuberculosis emphasize the extreme importance of connecting tuberculosis work and child welfare work closely together, and of affiliating both to

¹ See "The Present Position of the Tuberculosis Problem," by Sir Arthur Newsholme, K.C.B., M.D., F.R.C.P., the *Lancet*, May 29, 1926, pp. 1021-1026.

general public health work. 5. Steady educational work is required until the public realize that our present anti-tuberculosis work is sound and beneficent, and that it needs to be extended in every direction. Until we are in a position to say that in every area every tuberculous patient is receiving throughout the whole of his sick life such care as will give him the best chance of recovery, and which, whether recovery is possible or not, will secure comfort for him, and protection against infection of all who are associated with him, we cannot be satisfied. When this can be said, the present rate of decline in the death-rate from tuberculosis will become more rapid, and one of the chief causes of present suffering and distress and the burden of dependent widows and children which follows later will be very greatly decreased."

THE SUCCESS AND FAILURE OF SANATORIA.

The sanatorium possibly provides the best means whereby known measures of real value can be applied to the tuberculous patient. But these measures are many, and the results which follow their application depend on many factors, not the least important being those connected with the personality of the medical and nursing staffs. There are sanatoria good, bad, and indifferent, and patients also can be similarly classified as good, bad, and indifferent. In forming a judgment on the success or failure of sanatorium treatment it is very necessary to consider not only the institution and its climatic position and general management, but the psychological atmosphere which prevails. B. S. Nicholson, M.D., D.P.H., (T.O. to the Derbyshire County Council), in Dr. R. de Veil King's Annual Report as M.O.H. to the Ilkeston Town Council, deals with a point of considerable importance when attempting to express in statistical form the results of sanatorium treatment. He deals with the recklessness of ex-sanatoria patients as follows: "I find on looking back over the years that the death-rate amongst the Ilkeston patients (from pulmonary T.B.) is greater than it ought to be, and decidedly greater than in other districts which I have observed in this county. This is especially true of ex-sanatoria cases, and is a very *regrettable result*. I feel that the result is largely due to the false impression that seems to prevail among ex-sanatoria patients, that a short period of several months at a sanatorium is sufficient to arrest a disease like pulmonary T.B., and that on coming home, feeling as well as they do, they can at once resume their old occupation and very often their old bad habits and ways of life, the consequence being that, in a short time, they again show signs of advancing disease—an advance which more often than not leads steadily towards a fatal termination. How I wish my patients would remember what is invariably my parting advice to them, to continue the fight, and maintain at whatever personal cost a vigilance against any circumstance or habit which would act deleteriously on the progress of their convalescence. Only by the most persistent efforts and careful attention to a hygienic life can they hope in the end to acquire sound lungs in a sound body. . . . When will the people grasp the all-important fact that whilst pulmonary T.B. is a *curable* disease, it is *only* curable in its earliest stages, and that the chances of permanent recovery diminish in any one case in direct ratio to the duration of the disease before treatment is instituted?" Certainly, every patient before

leaving a sanatorium should receive definite personal instruction and clear advice regarding the ordering of his personal hygiene, and his friends when possible should also be given to understand that constant vigilance and care will be needed if recurrence and relapse are to be avoided.

NOTES AND RECORDS.

The Twelfth Annual Conference of the National Association for the Prevention of Tuberculosis was held in the City of Glasgow, July 1-3. A report will appear in our next number. In due course a volume of the Proceedings will be published.

The Fifth Conference of the International Union against Tuberculosis will be held at Washington, U.S.A., September 29-October 2. The International Union against Tuberculosis was founded in 1920. The headquarters are in Paris, and in close relationship with the League of Red Cross Societies. Tuberculosis Conferences under the auspices of the Union have been held at Paris (1920), London (1921), Brussels (1922), and Lausanne (1924). Subjects of great interest have been considered and methods for dealing with tuberculosis discussed at these conferences, at which leading scientists from all over the world are present. The International Union is directed by representatives of all the National Tuberculosis Associations, or in the absence of such association by representatives of the Government, of the countries within the League of Nations, and the United States of America. Each country is represented on the Council of the Union by a definite number of representatives, Great Britain having five such official delegates. For discussion at the forthcoming Conference the subjects chosen are: (1) "The Part Played by Contagion in Tuberculosis among Adults"; (2) "Anatomical Structure of Tubercle, from Histogenesis to Cavity"; (3) "Tuberculosis and Milk." The Conference is open to any member of the public (medical or lay), as follows: either (a) as an Ordinary Member of the International Union, on payment of an annual subscription of £1, which includes the quarterly Journal of the Union, as well as the right of attending the bi-annual conference, and the Transactions published afterwards; or (b) as a member of the Washington Conference, on a single payment of £1, which includes attendance at the forthcoming Conference and copy of the Transactions published afterwards. Those desiring to attend the Conference should make application to the Secretary, National Association for the Prevention of Tuberculosis, 20, Hanover Square, London, W. 1.

Under the auspices of the Fellowship of Medicine, 1, Wimpole Street, W. 1, an Intensive Course will be held at the Brompton Hospital for Consumptives, August 9-14.

A post-graduate Tuberculosis Course will be held at Davos, August 22-27. Dr. Bernard Hudson, of the Victoria Sanatorium, Davos-Platz, Grisons, Switzerland, will be glad to furnish medical confères with particulars.

The Twenty-second Annual Meeting of the American National Tuberculosis Association will be held at Washington, October 4-7. Particulars from Dr. Linsby R. Williams, National Tuberculosis Association, 370, Seventh Avenue, New York City.